

Reply to Office Action dated June 16, 2006

Application Serial No. 10/038,264

Reply dated July 19, 2006

Remarks/Arguments

The present amendment is made in response to the Notice of Non-Responsive Amendment dated June 16, 2006. Claims 24-28 are pending.

Applicant has amended claim 24 to more clearly recite that the invention is directed at the metallic pads of a solder joint in an electronic package, such as a ball grid array. Specifically, claim 24 has been amended to recite:

A solder joint for interconnecting a semiconductor chip and a substrate, comprising:
a first metallic pad electrically and physically connected to said substrate and having a
substantially planar first lower surface engaging said substrate and a first upper
surface including a first plurality of serpentine undulations extending upwardly;
a second metallic pad electrically and physically connected to said chip and having a
substantially planar second upper surface engaging said chip and a second lower
surface including a second plurality of serpentine undulations extending
downwardly; and
solder interconnecting said first upper surface with said second lower surface, whereby
micro-cracks forming in said solder adjacent to said first upper surface and said
second lower surface will encounter said first plurality of serpentine undulations
and said second plurality of serpentine undulations, respectively.

The specification at Page 3 clearly sets forth that the present invention is directed toward ball grid arrays, column grid arrays, and surface mount technology (SMT), all of which are well known forms of electronic packages. It is well known in the art that an electronic package comprises a semiconductor chip attached to a substrate. Ball grid arrays, column grid arrays, and

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surface mount technology (SMT) simply describe the geometry used in mounting a semiconductor chip to a substrate.

With regard to the rejection in view of *Baker*, the reference discloses a *seat belt*. A seat belt: (1) is not an solder joint as that term is used in the specification, (2) is not physically and electrically interconnected to a semiconductor chip and a substrate, and (3) does not have microcracks forming at the juncture of the solder and the metallic pads. As a result, the pending claims include multiple elements not taught or suggested in *Baker*.

In a previous Request for Continuing Examination, Applicant pointed out that the Examiner's rejection of claim 24 failed to identify where microcracks encounter the undulations in *Baker*, as expressly recited in the claims. In response, and for the first time, the Examiner argued that microcracks were inherent in *Baker*. As this was the first time that the doctrine of inherency was ever relied upon by the Examiner, the holding of finality of the most recent Office Action was clearly improper, and is therefore respectfully traversed. *See* 706.07(b) (finality improper when *new issues* are raised). Moreover, the Examiner failed to provide any evidence that microcracks form in *Baker* and are hindered by the undulations, elements expressly set forth in the claims then pending. As explained in the specification of the present application, it is the intermetallic regions formed in a semiconductor solder joint that leads to micro-cracks. Without any evidence that this occurs in seatbelts, is an occurrence that would appear extremely doubtful, the claims of the present application were improperly rejected and the holding of finality was premature. Regardless, the claims currently recited in the application are distinct from the prior art in numerous ways.

Applicant has added dependent claims 25-28 directed toward the invention recited in claim 24.

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With regard to the withdrawal of claim 17, the Examiner argues that claim requires that the serpentine undulations be integral with the upper surface. Notably, Applicant has never used the word "integral" with respect to claim 17 and instead has recited "along." As the plain and ordinary meaning of "along" is "over the length of," claim 17 clearly encompasses the elected invention, which has an obstacle (i.e., undulations) formed *along* the upper surface. While the claim may not cover every non-elected invention, it nevertheless does encompass the elected species and should not have been unilaterally withdrawn by the Examiner, and the withdrawal is respectfully traversed.

A Petition for a One Month Extension is submitted herewith and the Examiner is enabled to charge any fees associated with this transaction to Deposit Account 50-1546.

In view of the foregoing amendments, the Examiner's reconsideration and allowance of the present application is believed to be in order. If the Examiner believes a phone conference with Applicant's attorney would expedite prosecution of this application, please contact the undersigned at (315) 218-8515.

Respectfully submitted,

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